

REMARKS

Counsel for Assignee/Applicants wishes to thank the Examiner for the courtesy of the recent interview, the substance of which is incorporated in these Remarks. For the reasons advances during the interview, and in view of the present amendments and arguments below, favorable reconsideration of this application is respectfully requested.

In the present Office Action of August 25, 2006, the Examiner rejected various ones of the claims as anticipated by published U.S. Application 2002/0194324 to Guha et al., or as obvious over Guha et al. in combination with one or both of published U.S. Application 2002/0087714 to Connor and U.S. Patent No. 6,459,682 to Ellesson et al. The basis for all rejections is the Office's continuing construction of the term "storage switch" in the claims as corresponding to an "LIC" system of Guha. The Guha reference discloses that the LIC comprises a collection of separate devices that form a storage network, which devices include a SAN storage switch that provides communications between servers and storage devices for accessing data, and includes a separate Quality of Service enforcer device that is not part of the SAN storage switch.

As previously asserted, it was pointed out during the interview and is again respectfully submitted, that the Office's claim construction and the rejections based upon this construction are legally improper for the same reasons presented in Applicants' Response of March 31, 2006, and in their Appeal Brief of July 5, 2006, because the Office's construction fails to give claim term "storage switch" its ordinary and customary meaning as would have been understood by one skilled in the art, fails to construe the

term storage switch as described, used and implicitly defined in the specification, and further fails to construe the term as does even the prior art.

Neither Guha nor the other cited art, alone or in combination, discloses or suggests an intelligent storage switch in a storage network that provides quality of service, as claimed. In fact, none of the prior art of record even suggests incorporating quality of service into a storage switch, as provided by the invention.

As was discussed during the interview, the storage switch of the invention is an intelligent switch that performs a number of different storage related operations, including quality of service, that were previously performed by separate appliances in a conventional storage area network, as shown in Figure 1 and as explained at paragraphs [0007] – [0012] of the specification. Moreover, the storage switch of the invention overcomes a number of significant disadvantages of conventional storage area networks that have remained major obstacles to the widespread use of storage area networks, such as interoperability problems, lack of available skills, and high implementation costs (see [0011]).

The Rejections of the Claims are Traversed

In order to anticipate a claim under §102, a reference must identically disclose all of the elements of the claim. Guha does not identically disclose all of the elements of any of Claims 1, 3-4, 25, 33 and 35-36, since Guha does not disclose a linecard of a storage switch at all, much less a linecard that performs the method steps of Claims 1 and 3-4 or that includes the elements of Claim 25, 27, 33 or 35-36.

Likewise, to render a claim obvious under §103, references must teach or suggest all of the elements of a claimed invention, considered a whole. Since none of Guha, Connor or Elleson teaches or suggests a storage switch linecard that either performs the claimed method steps or that embodied the claimed elements, these references in combination cannot render the claimed invention obvious.

Although the rejections are again traversed, in an effort to advance the prosecution of this application and to reach an acceptable accommodation with the Office that will conclude prosecution, the independent claims have been amended to recite that it is a linecard in the storage switch of a storage network (a well-understood and well-defined element in the art) that affords communication to an initiator accessing a storage device in the storage network, that includes the claimed elements, and that performs the claimed functions, including providing quality of service, as shown in Figures 5 and 6 and as described in the specification at [0029]-[0065]. These amendments makes it clear that the claimed storage switch that interconnects initiators and storage devices in a storage network is in fact a storage switch as that term is used and understood in the art, but that it incorporates intelligence in a novel and non-obvious manner in a linecard that connects these devices and provides quality of service. None of the prior art of record discloses or suggests a linecard in a storage switch that embodies the claimed elements and that performs the claimed functions.

In particular, all independent Claims 1, 9, 16, 22, 25, 30, 33, 37 and 38 have been amended to call for the storage switch to have a linecard that affords communication between at least one initiator and at least one storage device, and to recite (in a variety of different ways) that the linecard comprises novel and non-obvious elements or performs

novel and non-obvious functions that control the quality of the communications. The claimed elements and functions are not disclosed or suggested by the prior art of record.

Specifically, independent Claim 1 recites a method that comprises “providing, by the linecard of the storage switch, quality of service . . . “. None of the prior art of record discloses or suggests, individually or in combination, a linecard that performs the claimed method.

Independent Claim 9 recites a method that comprises “guaranteeing, by the linecard of the storage switch, a minimum bandwidth . . .” and “estimating, by the linecard of the storage switch, an actual bandwidth . . .”. None of the prior art of record discloses or suggests, individually or in combination, a linecard that performs the claimed method.

Independent Claim 16 includes recitations of steps performed by the linecard of the storage switch that are similar to Claim 9, and further recites;

“determining if the actual bandwidth used by one initiator is excessive, and, if excessive, adjusting, by the linecard of the storage switch, a number of allowed concurrent requests for at least one initiator”.

None of the prior art of record discloses or suggests, individually or in combination, a linecard that performs the claimed steps.

Independent Claim 22 is directed to a method in which at least one initiator and at least one storage device are in communication with a linecard of the storage switch, and recites:

“providing a connection from the at least one initiator to the at least one storage device via the linecard of the storage switch in the storage network; and

adjusting, by the linecard of the storage switch, the number of requests allowed the at least one initiator to keep the bandwidth utilized by the at least one initiator within a specified range”.

None of the prior art of record discloses or suggests, individually or in combination, a linecard that performs the claimed method.

Independent Claim 25 is directed to a switch for a storage network having a linecard that comprises:

“a port to be coupled to an external device, wherein the external device includes at least one of an initiator and a storage device; and a bandwidth controller, the bandwidth controller including a processor, a traffic manager, and a buffer”.

None of the prior art of record discloses or suggests, individually or in combination, a linecard in a storage switch as claimed.

Independent Claim 30 is also directed to a switch having a linecard that includes:

“a storage processor, including a request controller;
a traffic manager in communication with the storage processor;
a buffer in communication with the traffic manager;
wherein if a specified threshold in the buffer is reached, the traffic manager is designed to activate the request controller”.

None of the prior art of record discloses or suggests, individually or in combination, a linecard in a storage switch as claimed.

Independent Claim 33 is directed to a storage switch having a linecard that comprises:

“a first port to be coupled to at least one initiator;
a second port to be coupled to at least one storage device; and
means for providing quality of service for a connection from the at least one initiator to the at least one storage device in the storage network”.

None of the prior art of record discloses or suggests, individually or in combination, a linecard in a storage switch as claimed.

Independent Claim 37 is directed to a storage network that includes a switch having a linecard in communication with an initiator and a storage device, and recites:

“wherein the linecard of the switch includes a traffic manager in communication with a buffer;
wherein when the buffer includes a number of packets from the initiator that exceeds a specified threshold, then the switch is designed to notify the initiator to reduce a number of concurrent requests”.

None of the prior art of record discloses or suggests, individually or in combination, a linecard in a storage switch of a storage network as claimed.

Finally, independent Claim 38 is directed to a machine readable media having instructions that when executed on a linecard of a storage switch in a storage network causes the linecard to perform a method comprising steps as recited in independent Claim 9. None of the prior art of record discloses or suggests, individually or in combination machine readable media as claimed.

None of the references to Guha, Connor or Elleson cited by the Office discloses, teaches or suggests a storage switch having an intelligent linecard that either includes the elements or performs the steps set forth in the independent claims, and this prior art cannot either anticipate or render obvious the claims.

Guha does not disclose a storage switch having a linecard as claimed. The LIC system of Guha comprises a storage system that includes a conventional SAN storage switch 42 that connects servers 39, 41 and 40 to storage devices 44. There is no disclosure in Guha of the storage switch including a linecard as claimed, or a linecard

that performs the quality of service steps claimed. Rather, Guha teaches a separate Quality of Service (QoS) enforcer 34 that, as shown in Figure 6, is associated with a separate load balancer 35 disposed between a router and the storage network, and that operates on incoming packets to the storage network from the Internet. Not only is the disclosed QoS enforcer 34 of Guha not on a linecard of a storage switch, the QoS enforcer also does not perform the same function performed by the invention. It does not operate to provide quality of service for an initiator accessing a storage device, i.e., within the storage network, as claimed.

Accordingly, Guha cannot anticipate any of the claims. Moreover, neither Connor nor Ellesson teach or suggest a linecard of a storage switch as claimed, and combining either or both of Connor or Ellesson with Guha does not cure the deficiencies in Guha, and the combination does not teach or suggest the storage switch and linecard or method of the claimed invention.

During the interview, the Examiner indicated that there was no invention involved in putting together two separate things, such as two boards, into one thing (a single board) that performs the same function. It is respectfully submitted that this approach is not the test for patentability prescribed by the statute. Whether it would have been obvious to combine separate devices or functions into one must be evaluated by considering the teachings of the prior art relative to the claimed invention as a whole; and in order to combine two prior art references, there must be some teaching or suggestion in the references themselves to make the combination.

Furthermore, it is respectfully pointed out that the invention claimed is not simply putting together into one thing two other things that were separate in the prior art. The prior art does not disclose or suggest either a storage switch having an intelligent linecard as claimed, or a storage switch that performs the functions of the switch of the invention.

Finally, the claims as amended clarify that it is the linecard of the storage switch that includes the elements claimed and that performs the recited functions, and this clearly differentiates the claimed invention from the collection of devices and system of Guha. Guha can neither anticipate the independent claims, nor establish in combination with either Connor or Ellesson a prima facie case for rejecting the claims.

The Claim Objections Are Overcome

In addition to the foregoing amendments, a number of the claims have also been amended to address the Examiner's objections that the meaning of "measuring an actual bandwidth" was unclear. The claims now refer to "estimating" a bandwidth, which avoids any possible ambiguity.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance, and early allowance of all claims is solicited.

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Respectfully Submitted,

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